



PASIG PERFORMING ARTS

SPECIAL INTEREST GROUP



PASIG MONTHLY CITATION BLAST: No. 102

March 2015

Dear Performing Arts SIG members:

We hope that all of you who attended CSM this year in Indianapolis enjoyed the programming and also hope that many of you were able to attend the PASIG business meeting! Here is a summary of the work done by the PASIG in the past year within the context of the APTA Orthopaedic Section Strategic Plan, as well as our business meeting notes:

The Orthopaedic Section APTA, Inc 2015-2019 Strategic Plan has goals with several objectives in the areas of *Standards of Practice, Education/Professional Development, Public Awareness, Research, Advocacy, and Member Engagement*. A detailed description will be posted soon on our Section's website. The PASIG has new works in progress that meet the objectives under these goals:

- a) *Standards of Practice*: We have a Practice Chair who is investigating current evidence to support best practices in performing arts physical therapy, and will promote the use of the ICF-base Clinical Practice Guidelines. We are learning from the Section how to provide web-based educational material.
- b) *Education/Professional Development*: We are updating our Independent Study Courses (ISCs). We are revalidating our 2004 Description of Specialized Clinical Practice to a Description of Advanced Specialized Practice, and working with the American Board of Physical Therapy Residency and Fellowship Education to promote the development of performing arts fellowships. We provide educational programming at CSM. We plan on providing pre-conference and conference programming at CSM 2016, and are considering PASIG courses at the 2016 Annual Orthopaedic Section Meeting.

- c) *Public Awareness:* We have a new flyer, a Facebook page, a Twitter handle, and are developing new media sites. We plan on having a booth at IADMS and PAMA.
- d) *Research:* We have supported student research presentations with offering an annual scholarship at CSM. We have been approved by the section to offer a \$15,000 research grant. We requested this, but have the grant on hold until we increase our encumbered funds through preconference courses and ISCs. We have a monthly citation blast that any member can contribute to, which includes the most current evidence on performing arts topics.
- e) *Advocacy:* Performing artists are often an underserved community, with limited access to performing arts orthopaedic physical therapy services. This is an area our SIG needs to address.
- f) *Member engagement:* We have appointed, elected, and recruited our SIG members for governance and work on Section and SIG initiatives. Our website has a membership profile update, affiliation sites, and bulletin board. We have a quarterly section in the Orthopaedic Practice Magazine. We have an annual business meeting at CSM to further develop communication and member involvement.

Business Meeting report:

1. Our leadership is listed in the following table for contact information:

Annette Karim, President	2014-2017	neoluvsonlyme@aol.com
Mark Sleeper, Vice President/Education Chair	2013-2016	markslee@buffalo.edu
Elizabeth Chesarek, Nominating Committee Chair	2013-2016	echesarek@gmail.com
Janice Ying, Nominating Committee	2014-2017	JaniceYingDPT@gmail.com
Brooke Winder, Research Chair	2014-2016	BrookeRwinder@gmail.com
Amanda Blackmon, Membership Chair	2014-2016	MandyDancePT@gmail.com
Sarah Wenger, Dancer Screening Chair	2014-2016	
Dawn Muci, Public Relations Chair	2014-2016	Dawnd76@hotmail.com
Mariah Nierman, Fellowship Taskforce Chair	2014-2016	Mariah.Nierman@osumc.edu
Reginald Cociffi-Pointdujour, Practice Chair	2014-2016	Regi7@live.com
Anna Saunders, Secretary/Student Scholarship Chair	2015-2017	annarosemary@gmail.com
Andrea N. Lasner, Nominating Committee	2015-2018	alasner1@jhmi.edu

2. Recognition: We recognized and thanked Tom McPoil, our outgoing Orthopaedic Section liaison, Rosalinda Canizares, our outgoing nominating committee chair, and Amy Humphrey, our Student Scholarship Chair, for their service to the PASIG. Thank you!!

3. Our funds: \$15,867 are encumbered, rolling one year to the next. \$2,500 annual PASIG stipend from the Orthopaedic Section is non-rolling.

4. Research: We need help with citation blasts! Contact Brooke Winder (brookerwinder@gmail.com) if you are interested in contributing

5. Call for authors for the PASIG section of the Orthopaedic Physical Therapy Practice Magazine. Contact Annette Karim (neoluvsonlyme@aol.com)

6. Education: We will be submitting proposals for PASIG Preconference and Conference courses. We invite you to submit and earmark for the PASIG, as well as contact Mark Sleeper (markslee@buffalo.edu), for upcoming CSM and Annual Meeting conferences.

7. Public Relations: We have a closed Facebook page. Our Twitter is *PT4Performers*. Contact Dawn Muci (Dawnd76@hotmail.com)

8. Nominating Committee: We will have several elected and appointed positions available in 2016: membership committee, dance screening chair, research chair, social media, fellowship task force chair. The process is: submit interest and CV. It is a 2-year term on appointed committee and a 3-year term on elected committee. Contact Elizabeth Chesarek (echesarek@gmail.com) or any of our nominating committee members if you are interested in serving in leadership or on any of the committees.

9. Dancer Screening: We would like to provide our members with a pre-professional dancer screen, and promote validity and reliability research of the screen. Contact Sarah Wenger (Sbw28@drexel.edu). We recognize and promote the Dance USA screen for professional dancers, encouraging members who work with professional dance companies to contact the Dance USA Taskforce for more information.

10. Membership: Please go to the PASIG website. Search for yourself as a member. Update your information and profile, interests, and if you have residencies available or if you are looking for a fellowship or residency.

11. Residencies and Fellowships: Orthopaedic clinical residency/ Orthopaedic Clinical Specialization should be done prior to entering a Performing Arts Fellowship. If you are interested in establishing a pilot site for a Performing Arts Fellowship, such as a Dance Medicine Fellowship or Music Medicine Fellowship, or helping with the DASP, contact Mariah Nierman (Mariah.Nierman@osumc.edu), our Fellowship Task Force chair. Mariah is also the Practice Analysis Coordinator for our DASP revalidation.

12. Student Scholarship: This year we had 6 entries, and the scholarship recipient was: *Musculoskeletal Injuries in Professional Modern Dancers: A 12-year Prospective Cohort Study* C. McBride, A. Gill. Congratulations!

13. Musicians group: contact Anna Saunders (annarosemary@gmail.com) or Janice Ying (JaniceYingDPT@gmail.com)

14. Mentoring: The Orthopaedic Section has a mentorship program. As members of the PASIG, this means you! If you are interested in being a mentor or receiving mentorship, contact Nata Salvatori: nata.salvatori@gmail.com

15. Independent Study Courses: Prior ISCs developed by the PASIG will be updated. Interested in helping? Contact Shaw Bronner: shaw.bronner@gmail.com or Julie O'Connell: joconnell@athletico.com

Annual Orthopaedic Section Meeting REGISTER NOW!



Our 3rd Annual Orthopaedic Section Meeting will be held at the beautiful Arizona Grand Resort & Spa in Phoenix, Arizona, May 14-16, 2015. During this 2-day meeting, we will explore the multidiscipline advances in rehabilitation through the episode of care of various lower extremity dysfunctions, treatment of osteoarthritis from presurgical to postsurgical, and the physical therapist's role in advances in regenerative medicine. Experts in the field will gather together for lecture presentations and small group, hands-on lab sessions. Our goal is to describe the current research in clinical practice. We want to create a meeting where we can interact, learn, and challenge each other as colleagues. We are listening to your suggestions, and will continue to strive to meet your educational needs as an advanced practicing clinician.

So please, plan to join us in **Phoenix, Arizona, on May 14-16, 2015**, for our third Annual Orthopaedic Section Meeting on "*Maximizing Outcomes: Multidisciplinary Advances in the Continuum of Care of Lower Extremity Dysfunctions*" at the beautiful Arizona Grand Hotel & Spa.

*****Interested in an Orthopedic Residency Program with a focus in Dance Medicine?**

The NYU Langone Medical Center (NYULMC) Harkness Center for Dance Injuries is a clinical site for NYU Steinhardt School of Education's Orthopedic Physical Therapy Residency (ORP). The ORP is a 12-month program that provides the Resident with an intensive, individualized experience in orthopedic physical therapy and dance medicine. The goal of the residency program, which follows the guidelines and accreditation standards of the American Physical Therapy Association (APTA), is to enable the Resident to develop the advanced clinical skills necessary to provide a superior level of patient care. Upon completion of the residency program, the Resident will have gained the knowledge and experience to be a competent advanced practitioner, and be qualified to sit for board certification in Orthopedics (OCS). Please note that all applicants must apply to New York University's Orthopedic Physical Therapy residency program and also be interviewed and accepted by the Harkness Center for Dance Injuries. Please

visit <http://steinhardt.nyu.edu/pt/opt> and <http://hjd.med.nyu.edu/harkness/education/healthcare-professionals> for more information.

The focus of this month's citation blast is an update on low back pain and spinal irregularities in dancers. If you have a particular topic you would like to explore, please contribute to our monthly blast!

Best regards,

Brooke

Brooke Winder, PT, DPT, OCS

Chair, PASIG Research Committee

Director of Physical Therapy, The Cypress Center, Pacific Palisades, CA

Home: brookeRwinder@gmail.com Work: brooke@thecypresscenter.com

PASIG Research Committee members:

Shaw Bronner PT, PhD, OCS, sbronner@liu.edu

Jeff Stenback PT, OCS, jsptocs2@hotmail.com

Sheyi Ojofeitimi PT, DPT, OCS, sojofeit@gmail.com

Susan D. Fain PT, DMA, sfain@ptcentral.org

Laura Reising, MS, PT, DPT, lbreising@gmail.com (EndNote Organizer)

PERFORMING ARTS CONTINUING EDUCATION, CONFERENCES, AND RESOURCES

Musician Health Series, Janice Ying, PT, DPT, OCS

Glendale Adventist Therapy and Wellness Center, Los Angeles area (Eagle Rock), CA

<http://www.musicianshealthcorner.com/>

Healthy Musician Series - Overuse

Orthopaedic Section Independent Study Course. *20.3 Physical Therapy for the Performing Artist.*

Monographs are available for:

- Figure Skating (J. Flug, J. Schneider, E. Greenberg),

- Artistic Gymnastics (A. Hunter-Giordano, Pongetti-Angeletti, S. Voelker, TJ Manal),

and

- Instrumentalist Musicians (J. Dommerholt, B. Collier).

Contact: Orthopaedic Section at: www.orthopt.org

Orthopaedic Section-American Physical Therapy Association,

Performing Arts SIG

http://www.orthopt.org/content/special_interest_groups/performing_arts

Performing Arts Citations and Endnotes

http://www.orthopt.org/content/special_interest_groups/performing_arts/citations_endnotes

ADAM Center

<http://www.adamcenter.net/>

Publications:

<http://www.adamcenter.net/#!vstc0=publications>

Conference abstracts:

<http://www.adamcenter.net/#!vstc0=conferences>

Dance USA

<http://www.danceusa.org/>

Research resources:

<http://www.danceusa.org/researchresources>

Professional Dancer Annual Post-Hire Health Screen:

<http://www.danceusa.org/dancerhealth>

Dancer Wellness Project

<http://www.dancerwellnessproject.com/>

Becoming an affiliate:

<http://www.dancerwellnessproject.com/Information/BecomeAffiliate.aspx>

Harkness Center for Dance Injuries, Hospital for Joint Diseases

<http://hjd.med.nyu.edu/harkness/>

Continuing education:

<http://hjd.med.nyu.edu/harkness/education/healthcare-professionals/continuing-education-courses-cme-and-ceu>

Resource papers:

<http://hjd.med.nyu.edu/harkness/dance-medicine-resources/resource-papers-and-forms>

Links:

<http://hjd.med.nyu.edu/harkness/dance-medicine-resources/links>

Informative list of common dance injuries:

<http://hjd.med.nyu.edu/harkness/patients/common-dance-injuries>

Research publications:

<http://hjd.med.nyu.edu/harkness/research/research-publications>

International Association for Dance Medicine and Science (IADMS)

<http://www.iadms.org/>

Resource papers:

<http://www.iadms.org/displaycommon.cfm?an=1&subarticlenbr=186>

Links:

<http://www.iadms.org/displaycommon.cfm?an=5>

Medicine, arts medicine, and arts education organization links:

<http://www.iadms.org/displaycommon.cfm?an=1&subarticlenbr=5>

Publications:

<http://www.iadms.org/displaycommon.cfm?an=3>

Performing Arts Medicine Association (PAMA)

<http://www.artsmed.org/>

<http://www.artsmed.org/symposium.html>

Interactive bibliography site:

<http://www.artsmed.org/bibliography.html>

Related links:

<http://www.artsmed.org/relatedlinks.html>

Member publications:

<http://artsmed.org/publications.html>

(Educators, researchers, and clinicians, please continue to email your conference and continuing education information to include in future blasts)

Low Back Pain and Spinal Irregularities in Dancers

Along with figure skating and gymnastics, most forms of dance demand intense ranges of motion and/or loading of the lumbar spine. This blast focuses on an update on low back pain with a specific focus on dance. The included citations highlight conditions from spondylolysis/spondylolisthesis to chronic back pain, and highlight more recent findings on muscle morphology, prevalence, interventions, and specific case study. I hope these citations span a range of topics that can apply to dancers and other performing artists across the lifespan.

Brooke Winder, PT, DPT, OCS

Director of Physical Therapy

The Cypress Center, Pacific Palisades, CA

Bouras T, Korovessis P. Management of spondylolysis and low-grade spondylolisthesis in fine athletes. A comprehensive review. *Eur J Orthop Surg Traumatol.* Nov 14 2014.

Objective

To provide evidence-based data about the aetiology, incidence, diagnosis and treatment of isthmic lumbar spondylolysis and low-grade spondylolisthesis and return to athletic activities in fine athlete.

Design

This is a comprehensive literature review. A thorough MEDLINE search in the period from 1973 to 2014 with the keywords: athlete, spondylolysis, low-grade spondylolisthesis, treatment and return to athletic activities was conducted.

Results

A total of 228 articles were initially enrolled from the search, and 74 case series and reviews were finally included because they referred to incidence, diagnosis, treatment and return to play in fine athletes with symptomatic isthmic spondylolysis and low-grade (Meyerding I and II) spondylolisthesis. There were 13 studies reporting surgical treatment (194 patients of average age 19 years) and 14 studies with conservative treatment (589 patients of average age 15.7). The percentage of athletes who were successfully treated with conservative or operative treatment was 85 and 87.8 %, respectively.

Conclusion

Conservative treatment including physiotherapy and bracing is the mainstay in the treatment of symptomatic spondylolysis and low-grade isthmic spondylolisthesis in fine athletes. If consequent treatment fails, the operative treatment (pars repair and short fusion) is decided. Return to play following surgery varies from 6 to 12 months with prohibition in collision sports. Return to play is mostly depended on specific sport activity.

Drezewska M, Sliwinski Z. Lumbosacral pain in ballet school students. Pilot study. *Ortop Traumatol Rehabil.* Mar-Apr 2013;15(2):149-158.

BACKGROUND: The unique biomechanical demands placed on ballet students predispose to injury and pain. The aim of this study was to evaluate the prevalence of lumbosacral pain in ballet school students and to identify possible risk factors for the pain.

MATERIAL AND METHODS: The study group comprised 71 ballet school students, including 45 females and 26 males, aged 15-18 years (mean 16.5 years). In order to identify possible risk factors for pain, a survey was conducted, the angle of sacral bone inclination was measured using a mechanical inclinometer and the BMI was calculated. A VAS scale was used for a subjective assessment of pain intensity.

RESULTS: Low back pain was reported by 44 patients (62%). A comparison of sacral inclination angles in a position with the feet placed parallel and in the turnout position showed statistically significant changes in the angle among respondents reporting pain ($p < 0.05$).

CONCLUSIONS: 1. Compensation in the turnout position by increased anterior tilt of the pelvis may increase the risk of low back pain. 2. An angle of sacral bone inclination in turnout above or equal to 30° can increase the intensity of low back pain. 3. A BMI below 18.5 in female ballet school students can increase the risk of lumbosacral pain.

Garet M, Reiman MP, Mathers J, Sylvain J. Nonoperative treatment in lumbar spondylolysis and spondylolisthesis: a systematic review. *Sports Health.* May 2013;5(3):225-232.

Context: Both spondylolysis and spondylolisthesis can be diagnosed across the life span of sports-participating individuals. Determining which treatments are effective for these conditions is imperative to the rehabilitation professional.

Data Sources: A computer-assisted literature search was completed in MEDLINE, CINAHL, and EMBASE databases (1966-April 2012) utilizing keywords related to nonoperative treatment of spondylolysis and/or spondylolisthesis. Reference lists were also searched to find all relevant articles that fit our inclusion criteria: English language, human, lumbar pain with diagnosed spondylolysis and/or spondylolisthesis, inclusion of at least 1 nonoperative treatment method, and use of a comparative study design.

Data Extraction: Data were independently extracted from the selected studies by 2 authors and cross-referenced. Any disagreement on relevant data was discussed and resolved by a third author.

Results: Ten studies meeting the criteria were rated for quality using the GRADE scale. Four studies found surgical intervention more successful than nonoperative treatment for treating pain and functional limitation. One study found no difference between surgery and nonoperative treatment with regard to future low back pain. Improvement was found in bracing, bracing and exercises emphasizing lumbar extension, range of motion and strengthening exercises focusing on lumbar flexion, and strengthening specific abdominal and lumbar muscles.

Conclusion: No consensus can be reached on the role of nonoperative versus surgical care because of limited investigation and heterogeneity of studies reported. Studies of nonoperative care options suffered from lack of blinding assessors and control groups and decreased patient compliance with exercise programs.

Gildea JE, Hides JA, Hodges PW. Size and symmetry of trunk muscles in ballet dancers with and without low back pain. *J Orthop Sports Phys Ther.* Aug 2013;43(8):525-533.

Study Design Cross-sectional, observational study.

Objectives To investigate the cross-sectional area (CSA) of trunk muscles in professional ballet dancers with and without low back pain (LBP).

Background LBP is the most prevalent chronic injury in classical ballet dancers. Research on nondancers has found changes in trunk muscle size and symmetry to be associated with LBP. There are no studies that examine these changes in ballet dancers.

Methods Magnetic resonance imaging was performed in 14 male and 17 female dancers. The CSAs of 4 muscles (multifidus, lumbar erector spinae, psoas, and quadratus lumborum) were measured and compared among 3 groups of dancers: those without LBP or hip pain ($n = 8$), those with LBP only ($n = 13$), and those with both hip-region pain and LBP ($n = 10$).

Results Dancers with no pain had larger multifidus muscles compared to those with LBP at L3–5 ($P < .024$) and those with both hip-region pain and LBP at L3 and L4 on the right side ($P < .027$). Multifidus CSA was larger on the left side at L4 and

L5 in dancers with hip-region pain and LBP compared to those with LBP only ($P < .033$). Changes in CSA were not related to the side of pain (all, $P > .05$). The CSAs of the other muscles did not differ between groups. The psoas ($P < .0001$) and quadratus lumborum ($P < .01$) muscles were larger in male dancers compared to female dancers. There was a positive correlation between the size of the psoas muscles and the number of years of professional dancing ($P = .03$).

Conclusion In classical ballet dancers, LBP and hip-region pain and LBP are associated with a smaller CSA of the multifidus but not the erector spinae, psoas, or quadratus lumborum muscles.

Gildea JE, Hides JA, Hodges PW. Morphology of the abdominal muscles in ballet dancers with and without low back pain: a magnetic resonance imaging study. *J Sci Med Sport*. Sep 2014;17(5):452-456.

Objectives

To evaluate the morphology of transversus abdominis and obliquus internus abdominis muscles and the ability to “draw in” the abdominal wall, in professional ballet dancers without low back pain, with low back pain or both hip region and low back pain.

Design

Observational study.

Methods

Magnetic resonance images of 31 dancers were taken at rest and during voluntary abdominal muscle contraction. Measurements included the thickness of transversus abdominis and obliquus internus abdominis muscles, lateral slide of the anterior extent of the transversus abdominis muscles (transversus abdominis slide) and reduction in total cross sectional area of the trunk.

Results

The transversus abdominis and obliquus internus abdominis muscles were thicker in male dancers and the right side was thicker than the left in both genders. There was no difference in muscle thickness as a proportion of the total thickness, between dancers with and without pain, although there was a trend for female dancers with low back pain only to have a smaller change in transversus abdominis muscle thickness with contraction than those without pain. Transversus abdominis slide was less in female dancers than in male dancers. When gender was ignored, the extent of transversus abdominis slide was less in dancers with low back pain only. Reduction in trunk cross sectional area with contraction was not different between genders or groups.

Conclusions

This study provides evidence that the abdominal muscles (transversus abdominis and obliquus internus abdominis) are asymmetrical in dancers and although the abdominal muscles are not different in structure (resting thickness) in dancers with LBP, there is preliminary evidence for the behavioural change of reduced slide of transversus abdominis during the ‘draw in’ of the abdominal wall.

Kline JB, Krauss JR, Maher SF, Qu X. Core strength training using a combination of home exercises and a dynamic sling system for the management of low back pain in pre-professional ballet dancers: a case series. *J Dance Med Sci.* 2013;17(1):24-33.

Estimates of low back pain prevalence in USA ballet dancers range from 8% to 23%. Lumbar stabilization and extensor muscle training has been shown to act as a hypoalgesic for low back pain. Timing and coordination of multifidi and transverse abdominis muscles are recognized as important factors for spinal stabilization. The purpose of this study was to explore the effects of training methods using home exercises and a dynamic sling system on core strength, disability, and low back pain in pre-professional ballet dancers. Five participants were randomly assigned to start a traditional unsupervised lumbar stabilization home exercise program (HEP) or supervised dynamic sling training to strengthen the core and lower extremities. Measurements were taken at baseline and at weeks 3 and 6 for disability using the Patient Specific Functional Scale (PSFS), pain using the Numerical Pain Rating System (NPRS), core strength and endurance using timed plank, side-plank, and bridge positions, and sciatic nerve irritability using the straight leg raise (SLR). Data were analyzed using descriptive statistics. From initial to final measurements, all participants demonstrated an improvement in strength and SLR range, and those with initial pain and disability reported relief of symptoms. These results suggest that dynamic sling training and a HEP may help to increase strength, decrease pain, and improve function in dancers without aggravating sciatic nerve irritation.

Miletic D, Miletic A, Milavic B. Age-related progressive increase of lower back pain among male dance sport competitors. *J Back Musculoskeletal Rehabil.* Nov 11 2014.

BACKGROUND: Occurrence of musculoskeletal pain in dance sport dancers is often a cause for longer discontinuation of training, which affects the competition results.

OBJECTIVE: The aim of the research project was to determine the age-specific pain experience among male dance sport competitors by defining the proportions of pain status of fourteen body regions.

METHODS: The subject sample of 200 male dancers from 44 different countries and with international competitive experience was divided into three subsamples according to age. Three online questionnaires translated into eight world languages were used for data collection: (1) basic data questionnaire, (2) self-estimated functional inability because of pain questionnaire designed for dancers, and (3) health care – related questionnaire.

RESULTS: After examining the 14 topological regions, it was established that dancers most often report pain in the lower back region (53.5%), followed by knee (43%) and toe regions (40.5%). Significant differences were found using the Chi-

square test between the groups of dancers of different ages in the prevalence of pain in the lower back ($\chi^2=12.6$), shoulders ($\chi^2=9.7$), and hip region ($\chi^2=7$), with the highest, age-related progressive differences in the lower back region (36.2–54.9–63.4%) so older dancers had more pain. Often reported reasons for discontinuation of training increased with age are overuse syndrome/tendinitis (6.4–15.9–22.5%) and strain (14.9–29.3–31%). Most common causes for longer discontinuation of training are absence of partner (37%), injuries (24%), and overuse syndrome (10%).

CONCLUSION: Lower back pain is propounding health problem in male dancers and increases with age that cannot be resolved by decreasing training intensity. This research reveals that only 28% of male dancers will seek medical help because of occurrence of musculoskeletal pain. Multidisciplinary approach with the aim of long-term health protection and prolongation of dancing careers is required in future studies.

Nijs J, Meeus M, Cagnie B, et al. A modern neuroscience approach to chronic spinal pain: combining pain neuroscience education with cognition-targeted motor control training. *Phys Ther.* May 2014;94(5):730-738.

Chronic spinal pain (CSP) is a severely disabling disorder, including nontraumatic chronic low back and neck pain, failed back surgery, and chronic whiplash-associated disorders. Much of the current therapy is focused on input mechanisms (treating peripheral elements such as muscles and joints) and output mechanisms (addressing motor control), while there is less attention to processing (central) mechanisms. In addition to the compelling evidence for impaired motor control of spinal muscles in patients with CSP, there is increasing evidence that central mechanisms (ie, hyperexcitability of the central nervous system and brain abnormalities) play a role in CSP. Hence, treatments for CSP should address not only peripheral dysfunctions but also the brain. Therefore, a modern neuroscience approach, comprising therapeutic pain neuroscience education followed by cognition-targeted motor control training, is proposed. This perspective article explains why and how such an approach to CSP can be applied in physical therapist practice.

Quinlan E, Reinke T, Bogar WC. Spinous process apophysitis: a cause of low back pain following repetitive hyperextension in an adolescent female dancer. *J Dance Med Sci.* Dec 2013;17(4):170-174.

We report a case of a 13-year-old female dancer with spinous process apophysitis following repetitive microtrauma during end-range hyperextension movements. Following appropriate rest and limitation of hyperextension, she was able to return to her previous level of training. It is important to recognize that numerous diagnostic possibilities arise when presented with a young dancer with back pain. The intention of this case report is to compare and contrast the pertinent clinical and radiologic findings of spinous process apophysitis and its more common and

debilitating mimic, spondylolysis. The correct diagnosis is paramount in cases of this sort due to the variable treatment requirements of each disorder.

Roussel N, De Kooning M, Schutt A, et al. Motor control and low back pain in dancers. *Int J Sports Med.* Feb 2013;34(2):138-143.

Professional dancers suffer a high incidence of injuries, especially to the spine and lower extremities. There is a lack of experimental research addressing low **back** pain (LBP) in dancers. The aim of this study is to compare lumbopelvic motor control, muscle extensibility and sacroiliac joint pain between dancers with and without a history of LBP. 40 pre-professional dancers (mean age of 20.3 years) underwent a clinical test battery, consisting of an evaluation of lumbopelvic motor control, muscle extensibility, generalized joint hypermobility, and sacroiliac joint pain provocation tests. Also self-reported measurements and standardized questionnaires were used. 41 % of the dancers suffered from LBP during at least 2 consecutive days in the previous year. Only one dancer suffered from sacroiliac joint pain. Compared to dancers without a history of LBP, dancers with a history of LBP showed poorer lumbopelvic motor control ($p < 0.05$). No differences in muscle extensibility or joint hypermobility were observed between dancers ($p > 0.05$). Despite their young age, pre-professional dancers suffer from LBP frequently. Sacroiliac joint pain, generalized joint hypermobility or muscle extensibility appears unrelated to LBP in dancers. Motor control is decreased in those with a history of LBP. Further research should examine whether motor control is etiologically involved in LBP in dancers.

Steinberg N, Hershkovitz I, Peleg S, et al. Morphological characteristics of the young scoliotic dancer. *Phys Ther Sport.* Nov 2013;14(4):213-220.

Background

The literature lacks important data about the relationship between scoliosis and growth process, scoliosis and intensive exercise, scoliosis and morphological characteristics, and scoliosis and injuries, among young dancers.

Objective

The aims of the present study were to determine the extent to which dance experience, body structure, anatomical anomalies and injuries are associated with scoliosis, and to identify variables able to discriminate between scoliotic and non-scoliotic female dancers at time of screening.

Design

Cross-sectional cohort study.

Methods

One thousand two hundred and eighty-eight non-professional female dancers, aged 8–16 years, were screened for the current study. We determined their morphometrical profile (height, weight, BMI), dance discipline (as hours of practice

per week), manifestation of anatomical anomalies, and existing injuries. All dancers were clinically examined for presence of scoliosis.

Results

Three hundred and seven of the 1288 dancers (23.8%) were diagnosed as having scoliosis. Dance experience and body structure were similar for dancers with or without scoliosis. Scoliotic dancers presented a significantly higher prevalence of anatomical anomalies (such as genu varum, and hallux valgus). Back injuries were more common among scoliotic dancers compared to non-scoliotic dancers.

Conclusion

Screening and identifying the young scoliotic dancers prior to their advancing to higher levels of exercise is recommended. The scoliotic dancers should realize that there might be a connection between the presence of scoliosis and increased incidence of anatomical anomalies and back pain, hence, it should be suggested they seek help with an adequate assessment and exercise rehabilitation program.

Swain C, Redding E. Trunk muscle endurance and low back pain in female dance students. *J Dance Med Sci.* 2014;18(2):62-66.

Low back pain (LBP) is often cited as a common condition at all levels of dance. Evidence suggests that reduced endurance of the trunk muscles can predispose an individual to LBP. The purpose of this study was to examine differences in trunk muscle endurance in a sample of tertiary level dance students with and without LBP. Seventeen full-time female dance students were divided into two groups: dance students with LBP (N = 11), and without LBP (N = 6). All participants provided informed consent, and the study was approved by an institutional ethics review board. Participants performed four isometric tests that assess trunk muscle endurance: the right and left side plank, double straight leg raise (DSLRL), and the Sorensen test. A modified version of the Osaka City University test was used to assess the presence of LBP. A significant difference ($p < 0.05$) between groups was observed for the right and left side plank, as well as the DSLRL test, and students with LBP displayed lower levels of endurance compared to those without. No other significant differences were found. This study offers some evidence that reduced trunk muscle endurance is present among dancers with LBP and provides direction for future research into back health among dancers.

PASIG membership is free for all Orthopaedic Section members!

New members join here:

https://www.orthopt.org/sig_pa_join.php

Already a PASIG member? Update your information here:

https://www.orthopt.org/login.php?forward_url=/surveys/membership_directory.php